

**AMENDMENTS**

**IN THE CLAIMS:**

*Please cancel claims 18-20 as provided below:*

1. (Original) A ribbon beam ion implantation system comprising:  
an ion source operable to generate multiple ion species from a source material;  
an extraction system configured to extract the ion species from the ion source  
and generate a ribbon-shaped ion beam; and  
a mass analyzer comprised of a first permanent magnet and a second  
permanent magnet that generates a substantially uniform magnetic field across a beam  
path of the ribbon-shaped ion beam to select a species from the multiple species  
initially present in the ribbon-shaped ion beam.
2. (Original) The system of claim 1, further comprising an acceleration  
system aligned along the beam path that operates on the ion beam after the mass  
analyzer and accelerates or decelerates the ion beam to a predetermined implantation  
energy level.
3. (Original) The system of claim 1, wherein the extraction system is a triode  
extraction system operative to produce a converging beam.
4. (Original) The system of claim 1, wherein the ion beam extracted by the  
extraction system is at a relatively low energy.
5. (Original) The system of claim 4, wherein the relatively low energy is  
about 500 eV.

6. (Original) The system of claim 1, wherein the magnetic field generated by the mass analyzer has a length of about 5 cm through which the ion beam travels.

7. (Original) The system of claim 1, wherein the magnetic field is oriented along the ribbon-shaped ion beam's short dimension.

8. (Original) The system of claim 1, wherein the magnetic field is relatively high with rapidly decaying fringes.

9. (Original) The system of claim 1, wherein the multiple species include  $B^+$ , and  $F^+$ ,  $BF1^+$  and  $BF2^+$ , and the selected species is  $B^+$  or  $BF2^+$ .

10. (Original) The system of claim 1, wherein the multiple species include  $P^+$  and  $H^+$  and the selected species is  $P^+$ .

11. (Original) The system of claim 1, wherein the source material comprises boron trifluoride ( $BF_3$ ).

12. (Original) The system of claim 1, wherein the source material comprises phosphorous pentafluoride ( $PF_5$ ).

13. (Original) The system of claim 1, wherein the source material comprises arsenate ( $As_5$ ).

14. (Original) The system of claim 1, wherein the ion beam has a width of about 300 mm.

15. (Original) The system of claim 1, further comprising an end station having a wafer, wherein the ion beam is operative to implant the selected species on the wafer in a single pass.

16. (Original) The system of claim 1, wherein the extraction system comprises a control circuit operable to receive one or more inputs indicative of a desired ion species, and output a set of predetermined voltages for electrodes associated with the extraction system based on the one or more inputs.

17. (Original) The system of claim 16, wherein the set of predetermined voltages dictates an extraction energy of the ribbon-shaped ion beam entering the mass analyzer.

18-20. (Canceled).

21. (Original) A method of generating a ribbon type ion beam comprising:  
generating multiple ion species from an ion source;  
extracting the multiple ion species to form a ribbon-shaped ion beam having a short dimension and a wide dimension, wherein the wide dimension is substantially larger than the short dimension; and  
selecting a species and rejecting other species of the multiple species of the ion beam via a permanent magnet based mass analyzer.

22. (Original) The method of claim 21, further comprising accelerating/decelerating the ion beam to a desired energy level after selecting the species.

23. (Original) The method of claim 21, further comprising directing the ion beam towards a target wafer at an end station.

24. (Original) The method of claim 23, further comprising performing an ion implant on the target wafer with the ion beam in a single pass, wherein the target wafer has a diameter of about 300 mm and the wide dimension of the ion beam is greater than about 300 mm.

25. (Original) The method of claim 21, wherein the species is selected by applying a magnetic field via permanent magnets that deflects the ion beam across its short dimension.

26. (Original) The method of claim 21, wherein extracting the multiple ion species comprises:

- identifying the selected species; and
- configuring extraction electrodes with a set of predetermined voltages such that the extracted ribbon-shaped ion beam has an energy that is a function of the identified selected species.